
**Road vehicles— Unified diagnostic
services (UDS) —**

**Part 2:
Session layer services**

*Véhicules routiers — Services de diagnostic unifiés (SDU) —
Partie 2: Séquence des couches de services*





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ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 14229-2 was prepared by Technical Committee ISO/TC 22, *Road vehicles*, Subcommittee SC 3, *Electrical and electronic equipment*.

ISO 14229 consists of the following parts, under the general title *Road vehicles — Unified diagnostic services (UDS)*:

- *Part 1: Specification and requirements*
- *Part 2: Session layer services*
- *Part 3: Unified diagnostic services on CAN implementation (UDSonCAN)*
- *Part 4: Unified diagnostic services on FlexRay implementation (UDSonFR)*
- *Part 5: Unified diagnostic services on Internet Protocol implementation (UDSonIP)*
- *Part 6: Unified diagnostic services on K-Line implementation (UDSonK-Line)*

The following part is under preparation:

- *Part 7: Unified diagnostic services on Local Interconnect Network implementation (UDSonLIN)*

The titles of future parts will be drafted as follows:

- *Part n: Unified diagnostic services on ... implementation (UDSon...)*

Introduction

ISO 14229 has been established in order to define common requirements for diagnostic systems that are independent of the underlying serial data link.

To achieve this, ISO 14229 is based on the Open Systems Interconnection (OSI) Basic Reference Model in accordance with ISO 7498-1 and ISO/IEC 10731, which structures communication systems into seven layers. When mapped on this model, the services used by a diagnostic tester (client) and an Electronic Control Unit (ECU, server) are broken into the following layers in accordance with Table 1:

- Application layer (layer 7), unified diagnostic services specified in ISO 14229-1, ISO 14229-3 UDSonCAN, ISO 14229-4 UDSonFR, ISO 14229-5 UDSonIP, ISO 14229-6 UDSonK-Line, ISO 14229-7 UDSonLIN, further standards and ISO 27145-3 WWH-OBD.
- Presentation layer (layer 6), vehicle manufacturer specific, ISO 27145-2 WWH-OBD.
- Session layer services (layer 5) specified in this part of ISO 14229.
- Transport layer services (layer 4), specified in ISO 15765-2 DoCAN, ISO 10681-2 Communication on FlexRay, ISO 13400-2 DoIP, ISO 27145-4 WWH-OBD.
- Network layer services (layer 3), specified in ISO 15765-2 DoCAN, ISO 10681-2 Communication on FlexRay, ISO 13400-2 DoIP, ISO 27145-4 WWH-OBD.
- Data link layer (layer 2), specified in ISO 11898-1, ISO 11898-2, ISO 17458-2, ISO 13400-3, IEEE 802.3, ISO 14230-2 and further standards, ISO 27145-4 WWH-OBD.
- Physical layer (layer 1), specified in ISO 11898-1, ISO 11898-2, ISO 17458-4, ISO 13400-3, IEEE 802.3, ISO 14230-1, further standards, ISO 27145-4 WWH-OBD.

Table 1 — Example of diagnostic/programming specifications applicable to the OSI layers

| Applicability | OSI seven layer | Enhanced diagnostics services | | | | | WWH-OBD |
|---|------------------------|---|-------------|-------------------------|----------------|-------------------|-------------|
| Seven layer according to ISO/IEC 7498-1 and ISO/IEC 10731 | Application (layer 7) | ISO 14229-1, ISO 14229-3 UDSonCAN, ISO 14229-4 UDSonFR, ISO 14229-5 UDSonIP, ISO 14229-6 UDSonK-Line, ISO 14229-7 UDSonLIN, further standards | | | | | ISO 27145-3 |
| | Presentation (layer 6) | vehicle manufacturer specific | | | | | ISO 27145-2 |
| | Session (layer 5) | ISO 14229-2 | | | | | |
| | Transport (layer 4) | ISO 15765-2 | ISO 10681-2 | ISO 13400-2 | Not applicable | further standards | ISO 27145-4 |
| | Network (layer 3) | | | | | further standards | |
| | Data link (layer 2) | ISO 11898-1, ISO 11898-2 | ISO 17458-2 | ISO 13400-3, IEEE 802.3 | ISO 14230-2 | further standards | |
| | Physical (layer 1) | | ISO 17458-4 | | ISO 14230-1 | further standards | |

Road vehicles — Unified diagnostic services (UDS) — Part 2: Session layer services

1 Scope

This part of ISO 14229 specifies data link independent requirements of session layer services.

This part of ISO 14229 specifies common session layer services to provide independence between unified diagnostic services (ISO 14229-1) and all transport protocols and network layer services (e.g. ISO 15765-2 DoCAN, ISO 10681-2 Communication on FlexRay, ISO 13400 DoIP, ISO 14230-2 DoK-Line, etc.)

This part of ISO 14229 specifies a common service primitive interface between OSI layer 4 (Transport) and layer 5 (Session) via so-called service request/confirmation/indication primitives. This interface allows seamless implementation of ISO 14229-1 Unified diagnostic services (UDS) with any communication protocol titled "DoXYZ / CoXYZ" like ISO 15765 DoCAN – Diagnostic communication over Controller Area Network, ISO 13400 DoIP, ISO 10681 Communication over FlexRay, ISO 14230 DoK-Line.

ISO 15031 (emissions-related OBD) and ISO 27145 (WWH-OBD) support the standardized service primitive interface.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 14229-1, *Road vehicles — Unified diagnostic services (UDS) — Part 1: Specification and requirements*

3 Terms, definitions and abbreviated terms

3.1 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1.1

gateway

networking device that transfers the PDU on different OSI layers

EXAMPLE A network device that enables communication between control module networks that use different communication protocols, different communication rates, etc. That includes, but is not limited to, gateway functionalities like bridge, switch, router or application layer routing.